

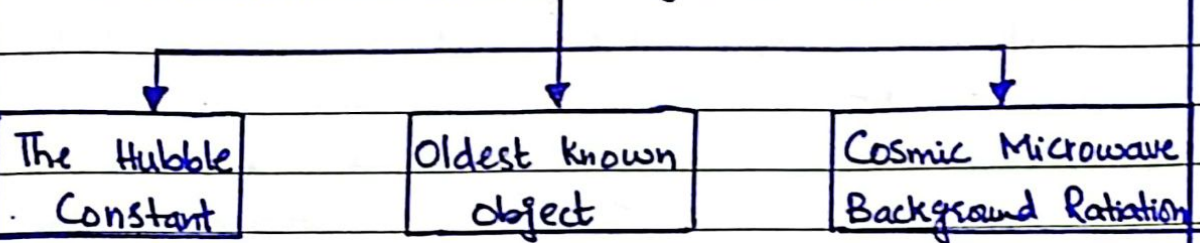
Question-

Describe different methods to estimate the age of the Universe.

Answer-

There are several methods to estimate the age of the Universe. Different scientists gave different methods to trace back to the age of Universe.

### Methods to Estimate Age of Universe



#### 1- The Hubble Constant

According to the Hubble Constant method, the age of Universe can be estimated by seeing at which rate the Universe is expanding. The expansion rate of the Universe can then be traced back to the age of the Universe. The Hubble Constant is generally denoted by  $H_0$ .

#### 2- Oldest Known Objects

Another method to estimate the age of the Universe is through oldest known objects, such as globular clusters (dense group of stars) and ~~white dwarf stars~~ white dwarf stars (remnants of dead stars). By analyzing these

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properties, such as their luminosity and composition, scientists can estimate their age. Then that information can be used to estimate the age of the universe.

3- Cosmic Microwave Background Radiation

Third method is to study the Cosmic Microwave Background (CMB) radiation. It is the leftover radiation of the Big Bang. By studying the patterns and fluctuations of in CMB radiation, scientist can estimate the age of universe.

These are several methods that can be used to determine the approximate age of the universe.

Question:-

What is "Black Hole"? How black holes are formed & discovered?

Answer:-

What is Black Hole

Black holes are massive object in space that is so dense in nature that within a certain radius, their gravitational field does not let anything escape from it, not even light.

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## How black holes are formed

Black holes are the stellar remnants that are formed when a massive star collapses at the end of their life cycle. So basically black holes are formed when a massive star die in a supernova explosion.

## How black holes are discovered

Black holes can be discovered by looking the movements of visible objects around them. A black hole's gravity is so strong that the nearby stars orbit around them. So one can look for the stars behaving strangely around a patch of "empty" space. From this black holes can be discovered and their density can also be calculated.

Cygnus X-1 was the first ever black hole that was discovered.

## Question:

What is Galaxy? The Earth belongs to which Galaxy?

Answer:

What is Galaxy.

"Galaxy is a gravitational bound system of stars, stellar remnants, interstellar gas, dust and dark matter."

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According to Astronomers, there are about 100 to 200 billion galaxies in the Universe. The word galaxy is derived from Greek galaxias, literally "milky," a reference to Milky Way Galaxy.

Examples of Galaxy

Andromeda and Milky Way are the examples are galaxy.

Classification of Galaxy

According to Hubble Tuning Fork diagram, there are 3 types of galaxy.

- Spiral galaxy
- Elliptical galaxy
- Lenticular galaxy

However, a new type of galaxy has been introduced recently, named as Irregular galaxy.

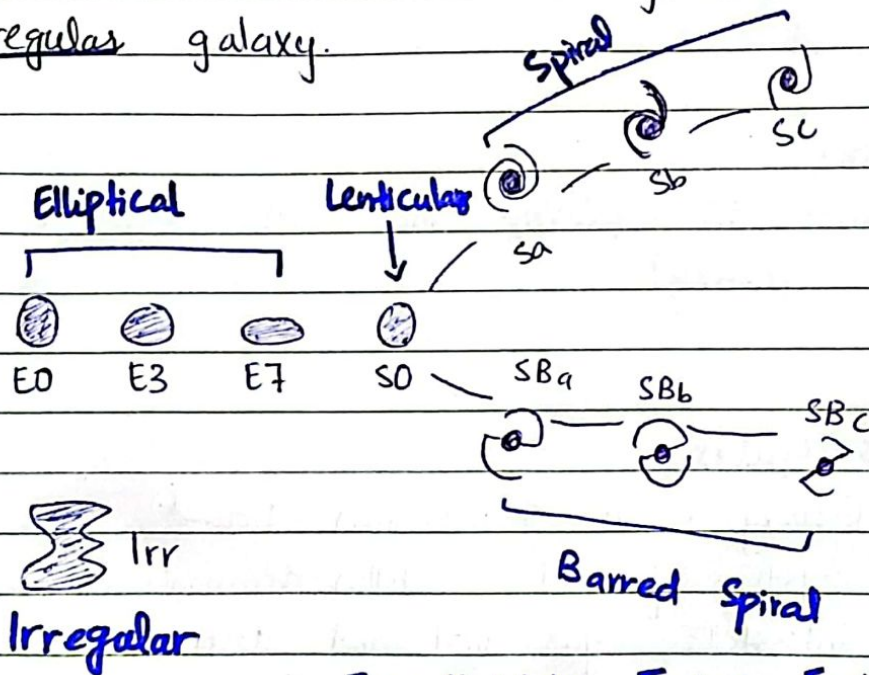


Fig: Hubble Tuning Fork



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## The Galaxy of Earth

The Earth belongs to the Milky Way Galaxy.

### A brief introduction of Milky Way Galaxy

Milky Way Galaxy is a large, disk-shaped galaxy that includes our solar system. Apart from solar system, there are about 200-400 billion stars in Milky Way Galaxy. The major arms of Milky Way are:

- Sagittarius arm
- Centaurus arm
- Cygnus arm
- Perseus arm

Our solar system is in a minor arm known as Orion arm.